

REMARKS

Claims 1-8, which are pending in the Application stand rejected under 35 USC 103(a) as being obvious over GB 2,262,527, Bujara et al. Applicants traverse the rejection because Bujara is insufficient to support a prima facie case of obviousness in that it lacks the basis for employing a gas stream comprising steam, in the manner of the claims. Applicants discuss more fully hereunder the patentable distinction of the claims by first summarizing the claimed invention, and then stating the rejection and how the claims avoid or overcome the same.

Summary of the Invention

The present invention relates to a process for producing particulate water-soluble cellulose derivatives, comprising:

- a) forming a feed composition comprising a cellulose derivative (e.g., being present in an amount of 20 wt. % to 50 wt. %, based on the total weight of the feed composition) and 50 wt. % to 80 wt. % of water, based on the total weight of the feed composition, wherein the cellulose derivative is at least one of swelled and dissolved in the feed composition;
- b) contacting, in a high rotational speed gas jet impact mill, the feed composition with a superheated gas mixture selected from (i) a superheated gaseous mixture of steam and an inert gas, and (ii) a superheated gas mixture of steam and air, (thus converting at least a portion of the water of the feed composition into the vapor phase), thereby converting the cellulose derivative of the feed composition into a solid state form of finely particulate particles, wherein the superheated gas mixture has a steam content of 40 wt. % to 99 wt. %, based on the total weight of the superheated gas mixture;
- c) separating the particulate cellulose derivative from the superheated gas mixture; and
- d) optionally drying the particulate cellulose derivative.

It has been found that the cellulose derivative solid particles produced using the process of the present invention have a high bulk density combined with a good flowability, and the proportion of fines in the product is very low. There is no decrease or only a minimal decrease in viscosity compared to the starting products. It was also found that the overall energy requirement of the process is reduced or virtually unchanged compared to the processes of the prior art, and since the heat exchange gas consists of a superheated steam/inert gas mixture or steam/air mixture, the energy used for the grinding is recovered, in the form of thermal energy, in the heat exchange gas and can thus be utilized or preferably converted into other forms of energy. It was also surprisingly found that no films or agglomerations are formed in the grinding plant and the maintenance expenditure is thus low.

Statement of the Rejection

The claims stand rejected on the grounds that:

"Bujara et al teach of a process of a process of making water-soluble cellulose derivatives of particulate size, (see Example 1). Bujara et al teach of the gellation of a cellulose derivative, wherein the water content is between 30 to 80 wt.%, (see page 5, lines 31-34). Bujara et al. also disclose of using various types of mills, in particular an impact mill is used for the cellulose compounds, (see page 10)."

In ascertaining the difference between Bujara's teachings and the claims, the Examiner finds that:

"The instant claims differ over the prior art by reciting specific ranges of the degree of substitution of the ether derivatives of cellulose."

With the Examiner's focus of the process difference being limited to the above, the Examiner's concluded that:

"[O]ne having ordinary skill in the art could utilize the teaching of Bujara et al. to optimize ranges, such as with the degree of substitution, through routine experimentation, see *In re Aller*, 220 F.2d 454, 456, 105 USPQ 23,235 (CCPA 1955)."

Statement of How the Claims Avoid or Overcome the Rejection

The Examiner's focus of the claimed process is unduly limited because it did not consider the invention as a whole, with particular reference to the step of

contacting, in a high rotational speed gas jet impact mill, the feed composition with a superheated gas mixture selected from (i) a superheated gaseous mixture of steam and an inert gas, and (ii) a superheated gas mixture of steam and air, (thus converting at least a portion of the water of the feed composition into the vapor phase), thereby converting the cellulose derivative of the feed composition into a solid state form of finely particulate particles, wherein the superheated gas mixture has a steam content of 40 wt. % to 99 wt. %, based on the total weight of the superheated gas mixture.

Hence, there is presented an issue of whether difference between the prior art and the claims as a whole has been ascertained. To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art, In re Royka, 180 USPQ 589 (CCPA 1974). All words in the claim must be considered in judging patentability of a claim against the prior art, In re Wilson 165 USPQ 494 (CCPA 1970). When the process step of contacting the feed with composition with a superheated gas mixture selected from (i) a superheated gaseous mixture of steam and an inert gas, and (ii) a superheated gas mixture of steam and air, the patentable distinction is better appreciated. No inference of this step is found in the prior art. As such, the record would not support a prima facie case of obviousness. Applicants therefore pray for the withdrawal of the rejection based on Bujara et al.

Bujara is discussed more fully hereunder to show that the difference in its understanding and expectation is such as would not have led to the claims. In the best light, Bujara discloses the use of transporting gas for conveying its cellulose compounds. More specifically, at page 10, lines 27-30, Bujara discloses that: "In the impact mill the cellulose compound is preferably conveyed by a gas stream, such as air, onto a rotating rotor equipped with grinding bars." In this regard, Bujara refers to air flow and air temperature. The teaching of the use of transporting gas to convey the cellulose compounds provides no basis for inferring the claim recited use of superheated gaseous mixture selected from (i) a superheated gaseous mixture of

steam and an inert gas, and (ii) a superheated gas mixture of steam and air. The skilled artisan reading Bujara would not have the understanding or expectation of the claimed invention.

The patentable distinction is all the more appreciated when one considers the advantages or properties of the invention. As aforesaid, it has been found that the cellulose derivative solid particles produced using the process of the present invention have a high bulk density combined with a good flowability, and the proportion of fines in the product is very low ($<15\mu\text{m}$). There is no decrease, or only a minimal decrease, in viscosity compared to the starting products. It was also found that the overall energy requirement of the process is reduced or virtually unchanged compared to the processes of the prior art, and since the heat exchange gas consists of a superheated steam/inert gas mixture or steam/air mixture, the energy used for the grinding is recovered, in the form of thermal energy, in the heat exchange gas and can thus be utilized or preferably converted into other forms of energy. It was also surprisingly found that no films or agglomerations are formed in the grinding plant and the maintenance expenditure is thus low. When the claimed invention and its advantages are considered, it becomes quite clear that the claims are patentable over Bujara, In re Papesh 137 USPQ 43 (CCPA 1963).

In view of the foregoing, it is Applicants' submission that the claimed invention is patentably distinct over the prior art. The claims directed thereto are in a condition for allowance, and Applicants pray for their allowance.

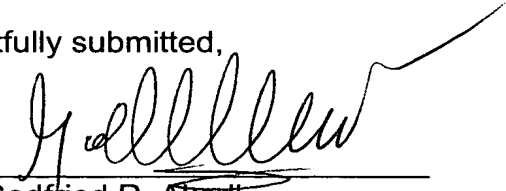
Bayer Chemicals Corporation
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-8340
FACSIMILE PHONE NUMBER:
(412) 777-8363

s:/sr/akorli/gra0249

Mo-6021

Respectfully submitted,

By


Godfried R. Akorli
Attorney for Applicants
Reg. No. 28,779